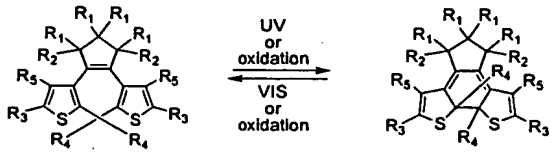
WHAT IS CLAIMED IS:

1. A compound selected from the group consisting of compounds reversibly convertible under photochromic and electrochromic conditions between a ring-open isomer (I) and a ring-closed isomer (II):



(I) (II)

wherein:

R_1 is selected from the group consisting of H and a halogen;

R_2 is selected from the group consisting of H, a halogen, CH=CH and a polymer backbone;

R_3 is selected from the group consisting of H, a halogen, CO_2Y (Y=H, Na, alkyl, aryl), and  (X=N,O,S);

R_4 is selected from the group consisting of alkyl and aryl; and

R_5 is selected from the group consisting of H, alkyl and aryl.

2. The compound as defined in claim 1, wherein said compound is convertible from said ring-open isomer (I) to said ring-closed isomer (II) under photochromic conditions and from said ring-closed isomer (II) to said ring-open isomer (I) under electrochromic conditions.

3. The compound as defined in claim 1, wherein said compound is convertible from said ring-closed isomer (**II**) to ring-open isomer (**I**) under photochromic conditions and from said ring-open isomer (**I**) to said ring-closed isomer (**II**) under electrochromic conditions.

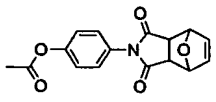
4. The compound as defined in claim 2, wherein said compound is also convertible from said ring-closed isomer (**II**) to said ring-open isomer (**I**) under photochromic conditions.

5. The compound as defined in claim 4, wherein said compound is also convertible from said ring-open isomer (**I**) to said ring-closed isomer (**II**) under photochromic conditions.

6. The compound as defined in claim 1, wherein the electrochromic conversion between said isomers (II) and (I) is catalytic.

7. The compound as defined in claim 1, wherein R_1 is F.

8. The compound as defined in claim 1, wherein R_1 and R_2 are F, R_3 and R_4 are  (X=S) and R_5 is H.

9. The compound as defined in claim 1, wherein R_1 and R_2 are F, R_3 and R_4 are selected from the group consisting of aryl,  and R_5 is H.

10. The compound as defined in claim 1, wherein R_1 and R_2 are F, R_3 is H, and R_4 is  (X=S) and R_5 is H.

11. The compound as defined in claim 1, wherein R_1 and R_2 are F, R_3 and R_4 are  and R_5 is H.

12. The compound as defined in claim 1, wherein R_1 and R_2 are F, R_3 is  (X=S), R_4 is CH_3 and R_5 is H.

13. The compound as defined in claim 1,wherein R_1 and R_2 are F, R_3  (X=S), R_4 is CH_3 and R_5 is H.

14. The compound as defined in claim 1, wherein R_1 is H, R_2 is HC=CH, R_3 is Cl and R_4 and R_5 are H.

15. The compound as defined in claim 1, wherein R_1 is H, R_2 is HC=CH, R_3 is CO_2CH_3 and R_4 and R_5 are H.

16. The compound as defined in claim 1, wherein R_1 is H, R_2 is HC=CH, R_3 is  (X=S), and R_4 and R_5 are H.

17. The compound as defined in claim 1, wherein R_1 is H, R_2 is HC=CH and forms part of the main chain of a polymer, R_3 is Cl and R_4 and R_5 are H.

18. The compound as defined in claim 1, wherein R_1 is H, R_2 is HC=CH and forms part of the main chain of a polymer, R_3 is CO_2CH_3 and R_4 and R_5 are H.

19. The compound as defined in claim 1, wherein R_1 is H, R_2 is HC=CH and forms part of the main chain of a polymer, R_3 is CO_2H and R_4 and R_5 are H.

20. A polymer comprising the compound of claim 1, wherein R_2 forms part of the polymer main-chain.

21. The polymer as defined in claim 20, wherein said polymer is a homopolymer.

22. The polymer as defined in claim 21, prepared by ring-opening methathesis polymerization.

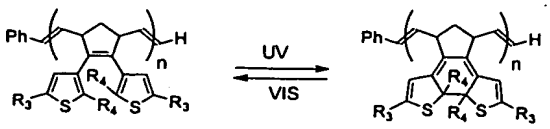
23. A method of preparing a compound according to claim 1, comprising carrying out the reaction steps set forth in any one of Schemes 2, 5, 6, 8, 10, 12, 13, 14, 16 and 18.

24. The use of a compound according to any one of claims 1 to 19.

25. The use according to claim 23, which is selected from the group consisting of:

(1) opthalmic lenses-eyeglasses that change color depending on the ambient light;
(2) actinometry, and molecular sensors;
(3) novelty items such as photochromic inks, paints and fibers;
(4) variable transmission filters - those that on command, regulate the amount and type of light that can be transmitted;
(5) high-density optical information storage systems (this invention is particularly well-suited to this application as it provides more information storage sites per unit area),
(6) photo-regulated molecular switches that can be incorporated into molecular-scale machinery;
(7) optoelectronic systems;
(8) reversible holographic systems; and
(9) molecular switches in molecule-based wires and circuitry.

26. A polymer comprising a compound interconvertible between a ring-open isomer (**III**) and a ring-closed isomer (**IV**):



(III) (IV)

where R_3 is selected from the group consisting of H, a halogen, CO_2Y (Y=H, Na, alkyl, aryl), and  (X=N,O,S) and n is between 10 and 100.

27. The polymer as defined in claim 26, wherein R_3 is selected from the group consisting of Cl, CO_2CH_3 and CO_2H.